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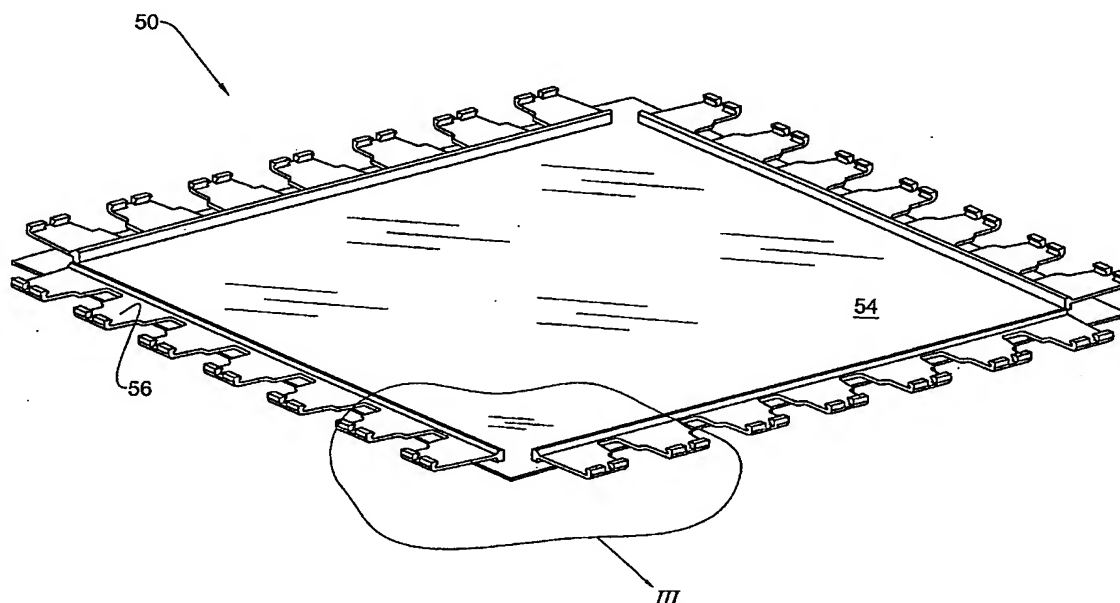
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(54) Title: **FURNITURE ITEM AND A METHOD FOR ATTACHING WEBBING THERETO**



(57) Abstract: A furniture item and a method for its manufacture, the item comprising at least one support portion, said at least one support portion (24,26) comprising a receiving frame (30) and a support member (50) comprising a webbing (54) made of flexible material fitted at its edges with frame-engaging profiles (56) formed with first engaging members (66) for secure engagement with corresponding second engaging members (32) of the receiving frame (30); the invention characterized in that said frame-engaging profiles (56) are integrally molded with said webbing (54).

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FURNITURE ITEM AND A METHOD FOR ATTACHING WEBBING THERETO

FIELD OF THE INVENTION

The present invention is generally concerned with furniture and more specifically it is concerned with applying a webbing such as a seat portion, a backrest, etc. to the furniture frame.

5 Hereinafter in the specification the term "*furniture*" denotes any type of furniture used for seating such as, for example, chairs, armchairs, rocking chairs, stools, seats, sofas, garden furniture, etc.

The term "*webbing*" as used herein in the specification and claims denotes a flexible surface of the furniture suitable for supporting a person using the furniture,
10 e.g. a seat, a backrest, a leg rest, etc. Such webbing may be typically made of a uniform material or made of flaps, typically transversing one another.

BACKGROUND OF THE INVENTION

A variety of methods exist for attaching webbing to a furniture's frame, to thereby provide a comfortable and pleasant support surface serving, e.g. as a seat
15 portion or a backrest.

Examples of disclosures of such methods are, for example, U.S. Patents Nos. 3,512,834, 5,015,034, 5,338,091 and 5,662,383.

It is a primary object of the present invention to provide a furniture wherein the webbing material is attached to the frame of the furniture in a fast, easy and cost
20 effective fashion. This is achieved by integrally molding of the webbing with profiles which are in turn easily engageable with a receptacle of the furniture's frame.

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SUMMARY OF THE INVENTION

According to the present invention there is provided a furniture item comprising at least one support portion, said at least one support portion comprising a receiving frame and a support member comprising a webbing made of
5 flexible material fitted at its edges with frame engaging profiles formed with first engaging members for secure engagement with corresponding second engaging members of the receiving frame; the invention characterized in that said frame engaging profiles are integrally molded with said webbing.

The webbing may be a sheet of material or a mesh or a plurality of straps,
10 typically transversely extending.

The webbing is made of or coated with a thermoplastic material. In accordance with one of its embodiments, the webbing is a mesh of fabric woven of polymeric yarns coated with thermoplastic material and the frame-engaging profiles are made of material having a substantially low coefficient of thermal expansion
15 (CTE). The frame-engaging profiles are made of a thermoplastic material which is injection moldable and heat weldable with the coating of the webbing. However, according to other embodiments, the frame-engaging profiles are made of non-thermoplastic material though moldable, e.g. metal, composite materials, etc.

In accordance with one particular embodiment the frame-engaging profiles
20 form a closed frame structure corresponding with the shape of the receiving frame. However, in accordance with another embodiment, the frame-engaging profiles are non uniform and are attachable one by one to the receiving frame.

In order to increase attachment of the frame-engaging profiles to the webbing material, it is advantageous that the webbing has a roughened texture at
25 least at zones attached to the frame-engaging profiles. Alternatively, or in addition, this may be obtained by forming said zones with pores, whereby material of the frame-engaging profiles penetrates through the webbing to thereby increase mechanical engagement therebetween. Furthermore, the frame-engaging profile may sandwich edges of the webbing whereby such sandwiching may be obtained
30 by penetration through the webbing.

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In accordance with one particular embodiment the frame-engaging profiles are detachable from the receiving frame whereby the support member may be removed, e.g. for cleaning and maintenance or replaced. Such removable connection may be, for example, a snap-type engagement.

5 The invention is further concerned with a method for manufacturing a support portion for a furniture item, said support portion comprising a receiving frame and a support member comprising a webbing made of flexible material fitted at its edges with frame engaging profiles formed with first engaging members for secure engagement with corresponding second engaging members of the receiving
10 frame; the method includes integrally molding of the said frame engaging profiles with the webbing.

In accordance with the method of the invention, the webbing is made of a mesh fabric woven of polymeric yarns coated with a thermoplastic material whereby the frame-engaging profiles are made of a material having a substantially
15 low coefficient of thermal expansion (CTE) and wherein during molding the frame-engaging profiles are heat welded to respective portions of the webbing.

In accordance with a particular embodiment, during the molding process, the material of the frame-engaging profiles penetrates through the webbing to thereby increase mechanical engagement therebetween.

20 **BRIEF DESCRIPTION OF THE DRAWINGS**

In order to understand the invention and to see how it may be carried out in practice, an embodiment will now be described, by way of a non-limiting example only, with reference to the accompanying drawings, in which:

25 **Fig. 1** is an isometric view of a furniture, a garden chair in the present example, in accordance with the present invention;

Fig. 2A is an isometric top view of a receiving frame removed from the chair of Fig. 1;

Fig. 2B is a top view of the receiving frame seen in Fig. 2A;

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Fig. 3A is a top isometric view of the support member removed from the chair, in a position as removed from the mold;

Fig. 3B is a bottom isometric view, illustrating the support member of Fig. 3A in a position prior to engaging with the receiving frame of Figs. 3A and 3B;

5 Fig. 4A is an enlargement of the portion marked III in Fig. 3A;

Fig. 4B is an enlargement of the portion marked III in Fig. 3A as seen from below; and

Fig. 5 is a local section along lines V-V in Fig. 1, illustrating how the support portion is engaged with the furniture item.

10 DETAILED DESCRIPTION OF THE INVENTION

Fig. 1 illustrates an armchair generally designated 10 of the type commonly used as garden furniture, and which comprises several frame components namely legs 12, armrests 14, a seat 16, and a backrest 18, which in the present example is inclinable between several respective positions.

15 In the present embodiment the frame components are made of molded plastic material though this is not necessarily the case and the frame components may be made, for example, of wood, metal, etc., or of a combination of several such materials.

Furthermore, the chair may be collapsible and/or stackable, as known with
20 such plastic chairs which are often referred to also as "*garden furniture*" and "*garden chairs*", respectively.

As can further be seen in Fig. 1, the seat 16 and the backrest 18 comprise a support portion 24 and 26, respectively, which as will be explained hereinafter in more detail are made of flexible webbing attached to the respective frame.

25 For the sake of clarity only, further reference will be made to the seat 16, though the skilled reader will appreciate that the same arrangements as will be hereinafter disclosed in detail, could apply to the back rest 18 and also to other furniture articles (not shown).

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Embedded within the seat frame 16 there is a receiving frame 30 (independently shown in Figs. 2A and 2B) which in the present embodiment is a rectangle though other shapes are possible just as well.

Receiving frame 30 may be integrally formed with the respective frame member (seat 16 or backrest 18) e.g. in an injection molding process, or else it may be fixedly attached thereto. For the sake of clarity, in the present example, the receiving frame has been removed from the seat 16.

As can be seen in Figs. 2A and 2B, the receiving frame 30 comprises a peripheral recess 32 substantially vertically extending from a top edge 34 towards a bottom edge 36 (Fig. 2A) with a plurality of openings 40 formed at a bottom surface of the recess 32.

The receiving frame 30 is made of a rigid material and has a webbing support surface 42 and a gradually inclined or curved surface 44 to allow some deformation of a webbing under load, i.e. weight of a person seated on the chair.

Further attention is now directed to Figs. 3A ; 3B and 4A; 4B illustrating a support member generally designated 50 comprising a surface of flexible webbing 54 (see also Figs. 1 and 5) and frame-engaging profiles 56 integrated with the webbing 54, as will become apparent hereinafter.

The webbing 54 is made of mesh fabric woven of polymeric yarns coated with a thermoplastic material, e.g. PVC. Such mesh is often referred to as Textilene® and is available in different colors and density.

In accordance with a particular embodiment the webbing 54 has a roughened surface at least at its peripheral zones (59 in Fig. 4A) where the frame-engaging profiles 56 extend. In addition, or alternatively, said peripheral zone 59 may comprise pores to further increase mechanical attachment with the frame-engaging profiles, as will be explained hereinafter.

The frame-engaging profiles 56 extend along edges of the webbing 54. In the present example the profiles 56 are individual profiles though in accordance with other embodiments (not shown) the profiles may be formed into a rigid frame consisting of two or more such frame-engaging profiles or, each edge of the

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webbing may comprise several frame-engaging profiles rather than a continuous profile as illustrated in the annexed figures.

The frame-engaging profiles 56 comprise a ruler portion 62 corresponding in shape with the recess 32 of the receiving frame 30 such that at the assembled position (Fig. 5) the ruler conceals the recess 32.

Each of the profiles 56 comprises a plurality of first engaging members 66 fitted at their free end with a lug 68 for snap engaging within recesses 40 of the receiving frame 30, as seen in Fig. 5.

The support member 50 is manufactured in an injection molding process where a sheet of webbing material 54 is applied into the mold (not shown) where injection moldable, thermoplastic material (e.g. ABS) is injected into the mold and whereby molten material flows through the pores of the webbing 54 allowed to expand into preformed support ribs 70 which may also be in the form of support surfaces (not shown). In such a process the frame-engaging profiles 56 are molded and integrated with the webbing 54 such that attachment of the profiles 56 to the webbing 54 is obtained by both heat welding of the thermoplastic material of the welded profiles which heat welds to the thermoplastic coating of the webbing and further by mechanical attaching, i.e. penetration of the molded material through the pores of the webbing and further by the sandwiching of the ribs 70. It is appreciated that rather than ribs 70 the edges of webbing 54 may be entirely sandwiched by corresponding portions of the frame-engaging profiles (not shown).

The frame-engaging profiles 54 are made of a material having a substantially low coefficient of thermal expansion (CTE) whereby after withdrawal of the integral support member 50 from the mold, the frame-engaging profiles substantially do not deform, retaining the webbing 54 in an essentially flat position. Fig. 3A illustrates the position of the support member 50 as it is withdrawn from the mold.

Engaging the support member 50 to the receiving member 30 is carried out by introducing the first engaging members 56 into the corresponding recesses 32 to thereby facilitate snap engagement of lugs 68 within recesses 40. It is appreciated

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that depending on the particular design the snap engagement may be disengaged, e.g. by the aid of a tool such as a screwdriver. It is further appreciated that other forms of engagement may be utilized, e.g. locking eyes projecting from the first engaging members engageable with corresponding locking eyes of the second
5 engaging members of the receiving frame, said eyes engageable with one another, for example by a pin extending through the eyes, etc. (this arrangement is not shown).

Tensioning the web over the receiving frame is obtained by ensuring that the distance between opposed recesses 32 of the receiving frame is slightly larger than
10 the respective distance between opposed frame-engaging profiles 56 whereby engagement of the support member with the receiving frame requires some amount of force.

Whilst the description hereinabove describes a specific embodiment and several applications of the invention, it will be understood by those skilled in the art
15 that the invention is not limited thereto and that other variations may be possible, without departing from the scope and the spirit of the invention herein disclosed. For example, a variety of engagements may be suited for fixedly engaging between the support member and the receiving frame. Otherwise, the support member may be formed in a variety of shapes and patterns and the support member may be
20 designed for easy removal, etc.

CLAIMS:

1. A furniture item comprising at least one support portion, said at least one support portion comprising a receiving frame and a support member comprising a webbing made of flexible material fitted at its edges with frame-engaging profiles
5 formed with first engaging members for secure engagement with corresponding second engaging members of the receiving frame; the invention characterized in that said frame-engaging profiles are integrally molded with said webbing.
2. A furniture item according to Claim 1, wherein the webbing is a sheet of material.
- 10 3. A furniture according to Claim 1, wherein the webbing is a mesh.
4. A furniture item according to Claim 1, wherein the webbing is made of a plurality of transversally extending straps.
5. A furniture according to claim 1, wherein the webbing is made of or coated with a thermoplastic material.
- 15 6. A furniture item according to Claim 1, wherein the webbing is made of mesh fabric woven of polymeric yarns coated with thermoplastic material.
7. A furniture item according to Claim 1, wherein the frame-engaging profiles are made of a material having a substantially low coefficient of thermal expansion (CTE).
- 20 8. A furniture item according to Claim 1, wherein the frame-engaging profiles are made of thermoplastic material.
9. A furniture item according to Claim 1, wherein the webbing has a roughened texture at least at zones attached to the frame-engaging profiles.
10. A furniture item according to Claim 1, wherein the webbing has a porous
25 texture at least at zones attached to the frame-engaging profiles.
11. A furniture item according to Claim 1, wherein the frame-engaging profiles form a closed frame structure corresponding with the receiving frame.
12. A furniture item according to Claim 1, wherein the frame-engaging profiles extend substantially along edges of the webbing.

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13. A furniture item according to Claim 1, wherein material of the frame-engaging profiles penetrates through the webbing to thereby increase mechanical engagement therebetween.
14. A furniture item according to Claim 1, wherein the frame-engaging profiles
5 are heat welded to respective portions of the webbing.
15. A furniture item according to Claim 1, wherein at least some portions of zones of the frame-engaging profiles attached to the webbing sandwich the webbing.
16. A furniture item according to Claim 1, wherein the furniture is a garden
10 furniture.
17. A furniture item according to Claim 1, wherein the frame-engaging profiles are detachable from the receiving frame.
18. A furniture item according to Claim 1, wherein the first engaging members of the frame-engaging profiles are snapingly engaged with the second engaging
15 members of the receiving frame.
19. A furniture item according to Claim 1, wherein the first engaging members of the frame-engaging profiles project into the second engaging members of the receiving frame and are lockingly engaged with one another.
20. A furniture item according to Claim 1, wherein the webbing is tensioned
20 upon engaging the frame-engaging profiles with the receiving frame.
21. A furniture item according to Claim 1, wherein the receiving frame is integral with a frame portion of the furniture.
22. A furniture item according to Claim 1, wherein the receiving frame comprises openings for receiving the frame-engaging profiles and the frame-
25 engaging profiles are formed with concealing portions, wherein upon engagement said concealing portions close the openings of the receiving frames.
23. A furniture item according to Claim 1, wherein prior to engagement of the support member to the support frame a plane of the webbing and a plane of the frame-engaging profiles are substantially parallel, whilst at the engaged position
30 said panes intersect one another.

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24. A method for manufacturing a support portion for a furniture item, said support portion comprising a receiving frame and a support member comprising a webbing made of flexible material fitted at its edges with frame-engaging profiles formed with first engaging members for secure engagement with corresponding
5 second engaging members of the receiving frame; the method includes integrally molding of the said frame-engaging profiles with the webbing.

25. A method according to Claim 24, wherein the webbing is made of mesh fabric woven of polymeric yarns coated with a thermoplastic material.

26. A method according to Claim 24, wherein the frame-engaging profiles are
10 made of a material having a substantially low coefficient of thermal expansion (CTE).

27. A method according to Claim 24, wherein during the molding process the material of the frame-engaging profiles penetrates through the webbing to thereby increase mechanical engagement therebetween.

15 28. A method according to Claim 24, wherein during molding the frame-engaging profiles are heat welded to respective portions of the webbing.

29. A method according to Claim 24, wherein at least some portions of zones of the frame-engaging profiles attached to the webbing sandwich the webbing.

30. A method according to Claim 24, wherein the frame-engaging profiles are
20 connectable to the receiving frame in a detachable fashion.

31. A method according to Claim 24, comprising the following steps:

- (a) Obtaining a mold;
- (b) Applying the webbing material into the mold;
- (c) Closing the mold and injecting molten material into the mold
25 to thereby mold the frame-engaging profiles integrated with said webbing;
- (d) Removing the integrated support portion from the mold.

32. A method according to Claim 24, wherein the webbing is a sheet of material.

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33. A method according to Claim 24, wherein the webbing is made of a plurality of transversally extending straps.

34. A method according to Claim 31, wherein during the molding process plane of the webbing and a plane of the frame-engaging profiles are parallel.

5 35. A method according to Claim 31, wherein during step (c) molten material of the frame-engaging profiles penetrates through the webbing to thereby increase mechanical engagement therebetween.

36. A support member for fitting to a support portion of a furniture item, said support member comprising a flexible webbing integrally molded with frame-
10 engaging profiles engageable with corresponding engaging members of a receiving frame of the support portion.

37. A support member according to Claim 31, wherein the webbing is made of or coated with a thermoplastic material.

38. A support member according to Claim 36, wherein the webbing is made of
15 mesh fabric woven of polymeric yarns coated with a thermoplastic material.

39. A support member according to Claim 36, wherein the frame-engaging profiles are made of a material having a substantially low coefficient of thermal expansion (CTE).

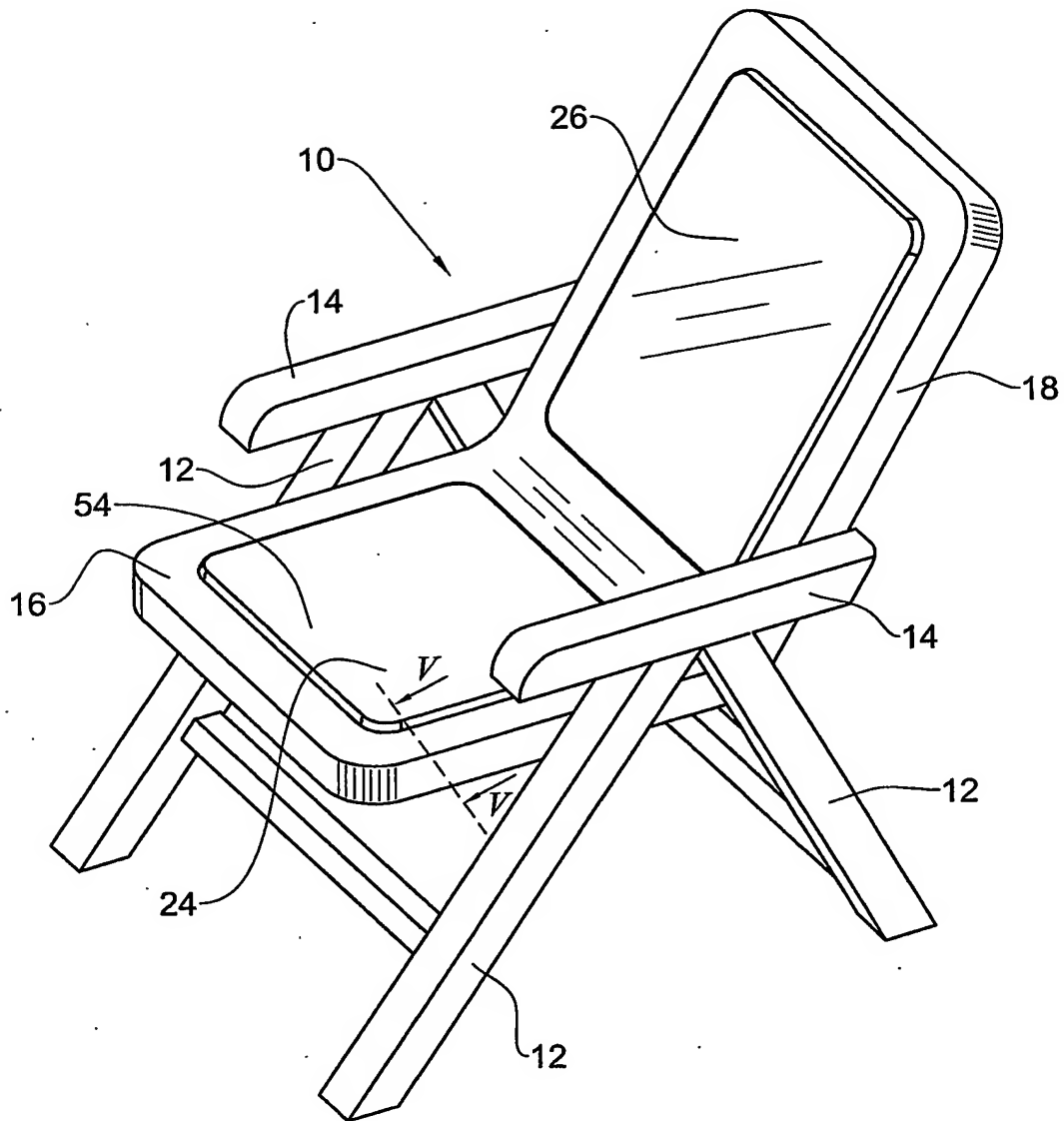
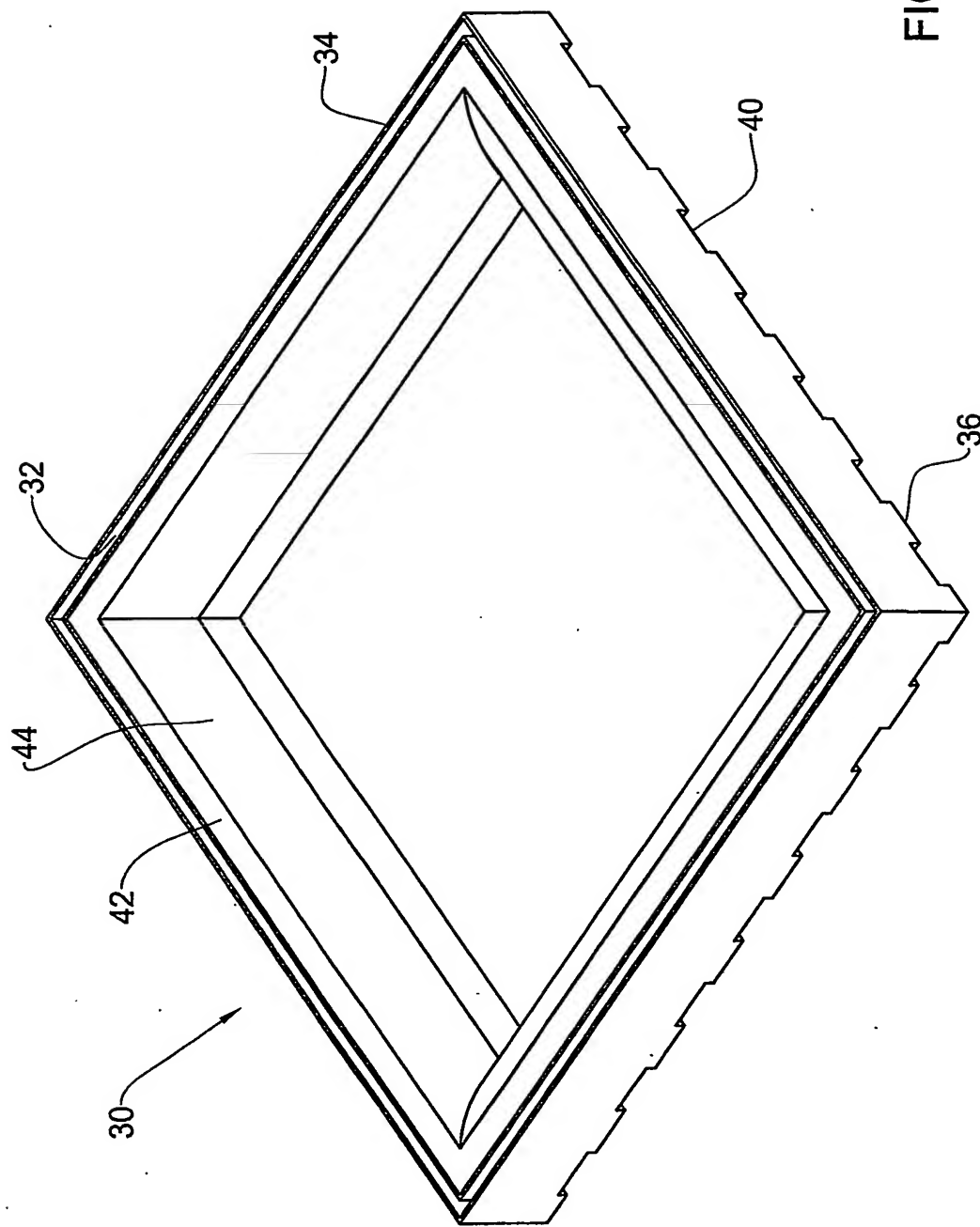


FIG. 1

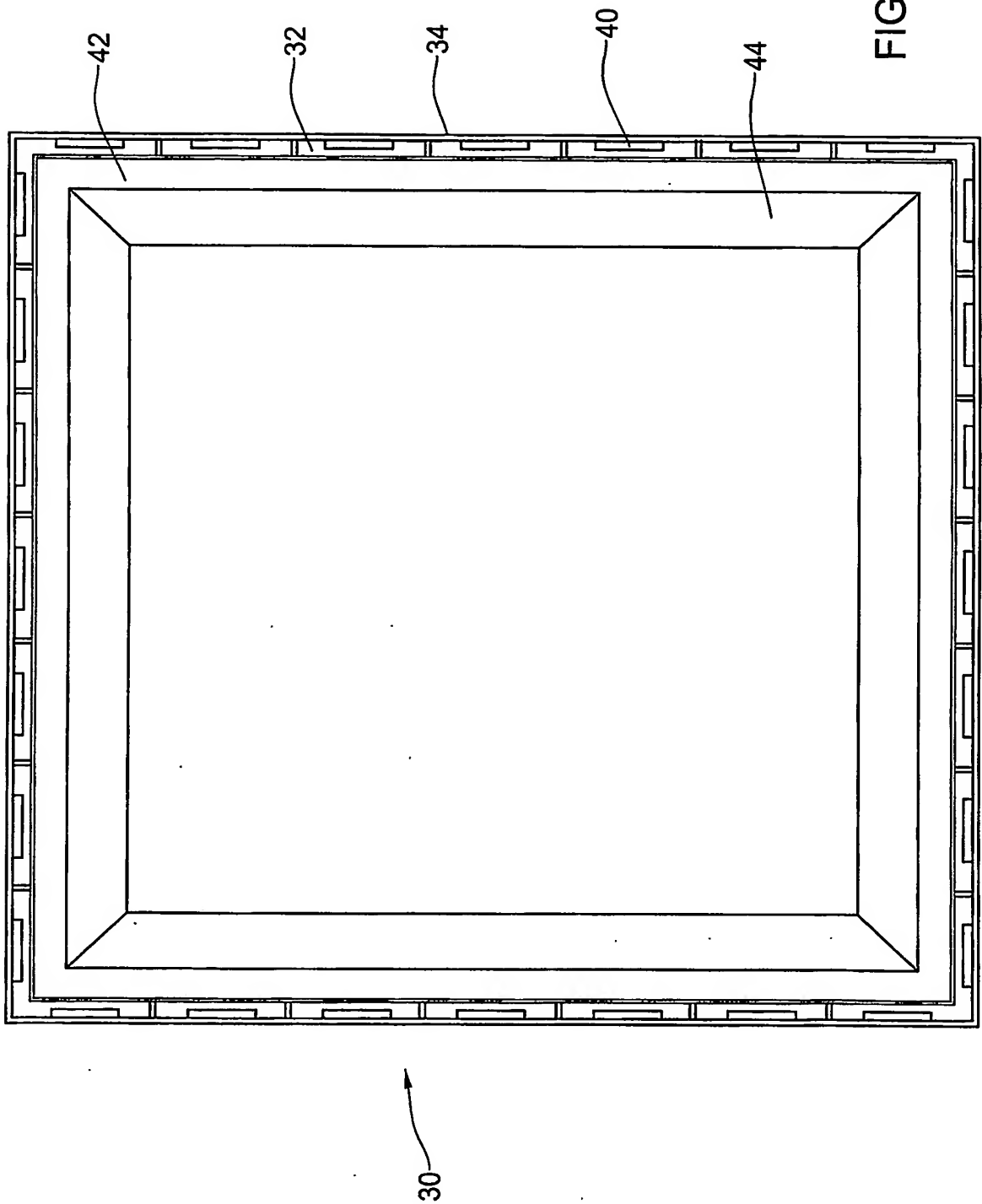
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FIG. 2A

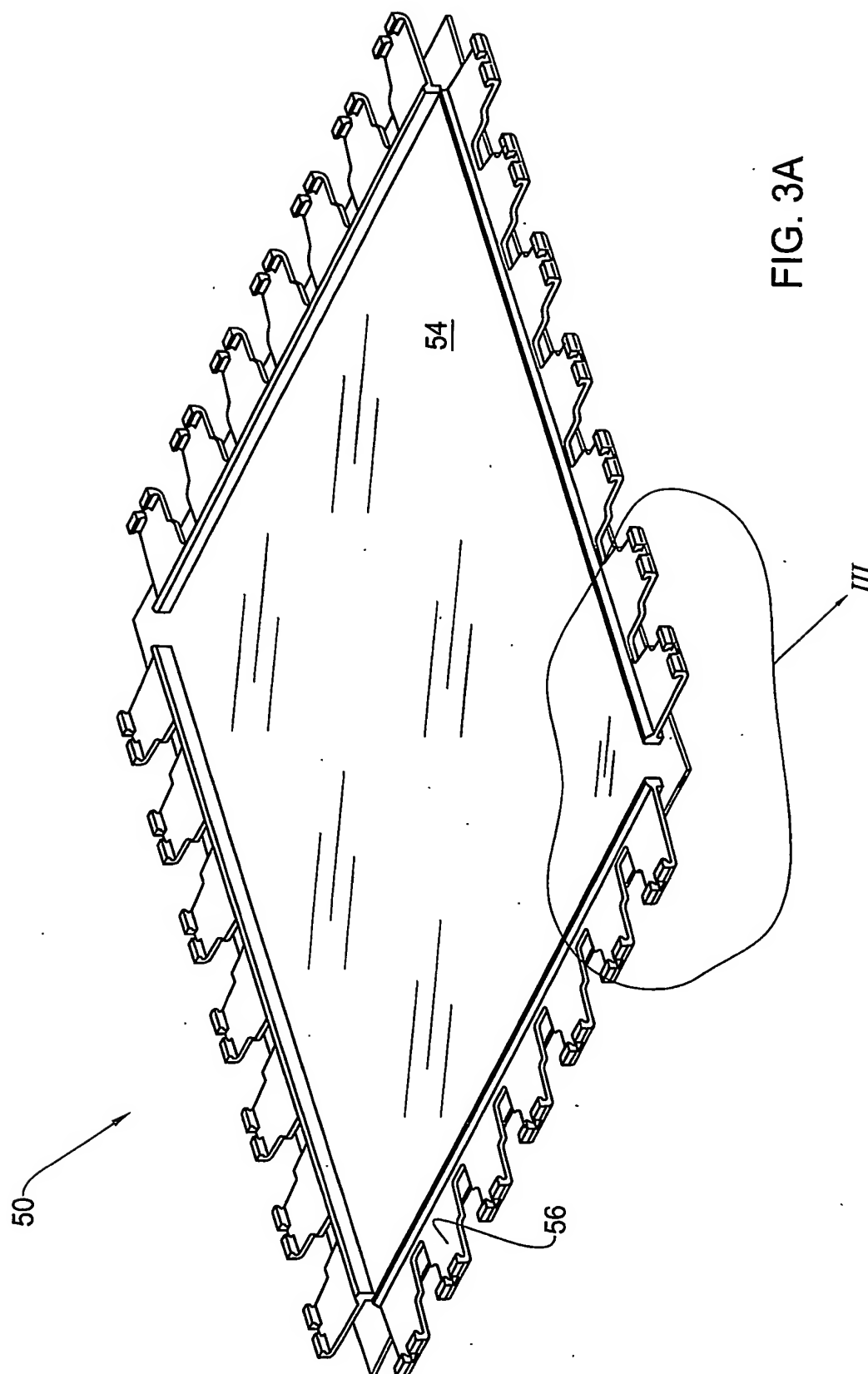


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FIG. 2B



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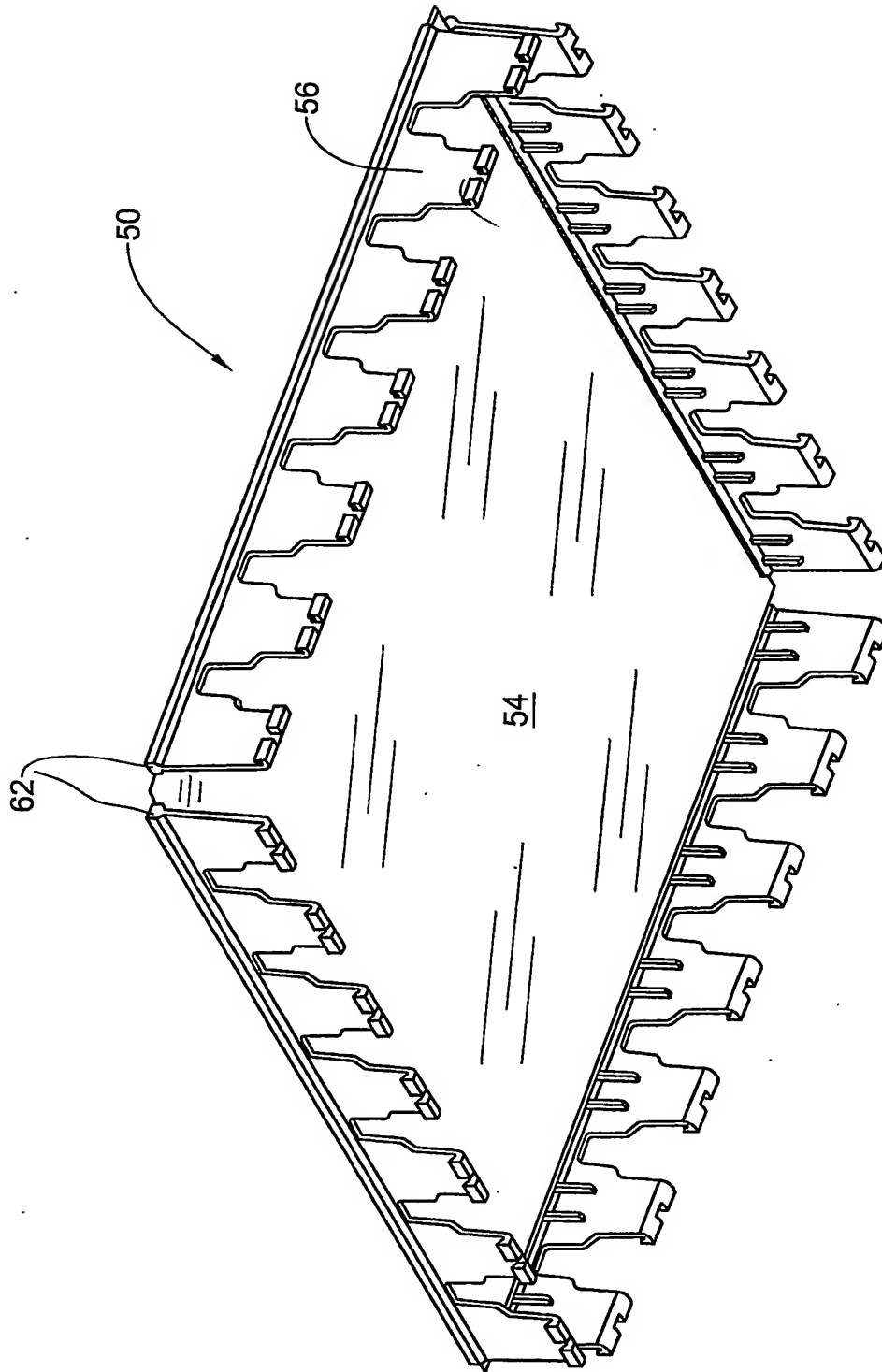


FIG. 3B

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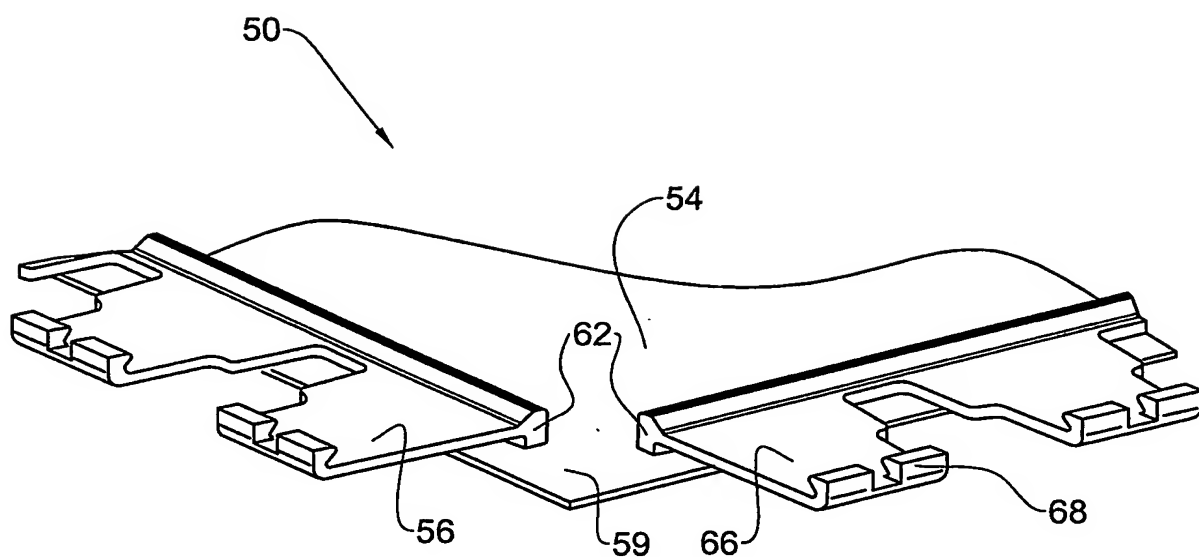


FIG. 4A

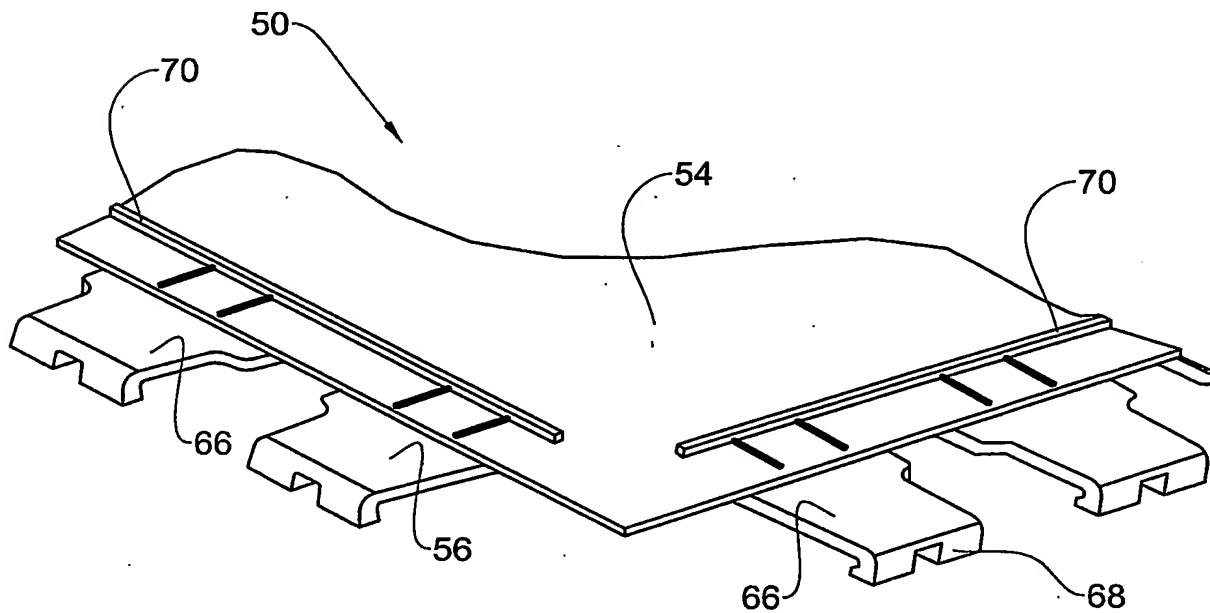


FIG. 4B

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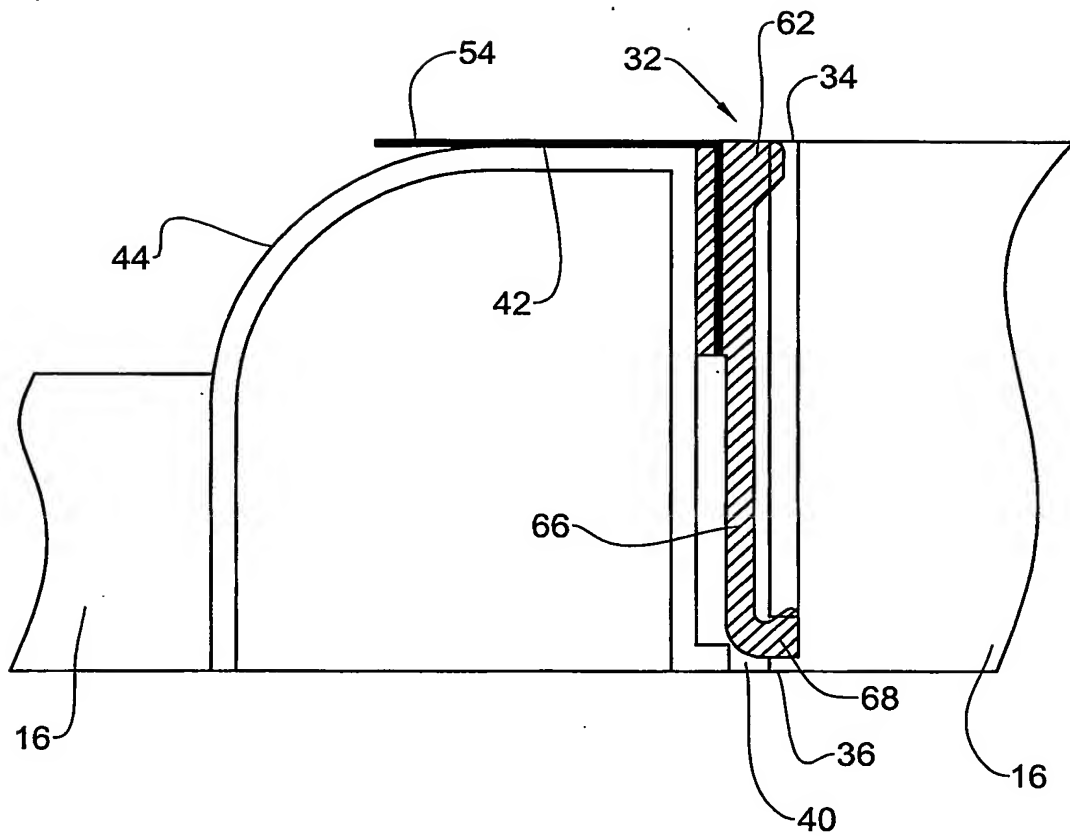


FIG. 5